Center Innovation Fund: AFRC CIF

Fiber Optic Augmented Reality System (FOARS)

Completed Technology Project (2016 - 2017)

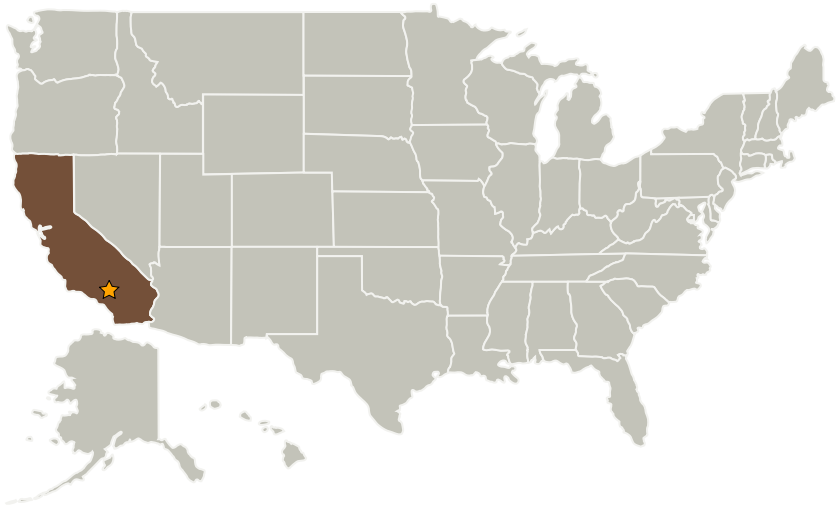
Project Introduction

Innovation: Fiber Optics Augmented Reality System. This system in form of a mobile app interacts real time with the actual FOSS(Fiber Optics Sensing System) data and displays augmented reality version of the fiber optics overlaid on the actual fibers and changes color depending on the expansion and contraction of the material the optical fiber is attached to. Technical Approach: Create 3D model of the fiber optics via Google Project Tango development kit and modify the model in Blender Creating the Augmented Reality app using Qualcomm's Vuforia SDK and Unity3D development platform. Obtain FOSS UDP data over Wi-Fi and decode the data within the app. Modifying AR model to respond real time to the received UDP packets

Anticipated Benefits

Technical Challenge: Perfecting the XYZ point capturing done by the Tango device to create a more accurate model. Accurately mapping the sensor locations on the 3D model of the fibers. Updating colors real time according to strain data. Current State-of-the-Art: The existing solution obtains 2D XY values from the fiber and reconstructs a 3D model using a mathematical approach. Presently, the surface containing the fiber optics and its associated strain data are studied at two separate locations creating a visual disassociation

Primary U.S. Work Locations and Key Partners



This research effort is working to visualize the individual measurements Armstrong's Fiber Optic Sensing System (FOSS) provides in a way that helps users understand how to view and analyze the data.

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Organizations Performing Work	Role	Type	Location
★Armstrong Flight Research Center(AFRC)	Lead Organization	NASA Center	Edwards, California

Primary U.S. Work Locations
California

Images

Project Image
This research effort is working to visualize the individual measurements Armstrong's Fiber Optic Sensing System (FOSS) provides in a way that helps users understand how to view and analyze the data.
(https://techport.nasa.gov/image/35784)

Organizational Responsibility

Responsible Mission Directorate:
Space Technology Mission Directorate (STMD)

Lead Center / Facility:
Armstrong Flight Research Center (AFRC)

Responsible Program:
Center Innovation Fund: AFRC CIF

Project Management

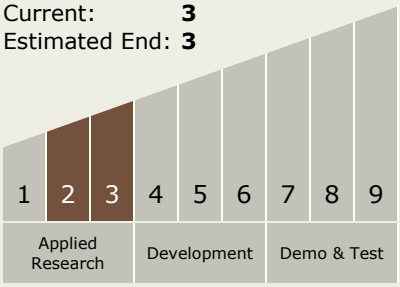
Program Director:
Michael R Lapointe

Program Manager:
David F Voracek

Principal Investigator:
Allen R Parker

Technology Maturity (TRL)

Start: **2**
Current: **3**
Estimated End: **3**



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Technology Areas

Primary:

- TX11 Software, Modeling, Simulation, and Information Processing
  - TX11.2 Modeling
    - TX11.2.3 Human-System Performance Modeling

Target Destination

Earth